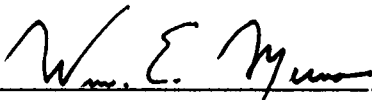


FIVE-YEAR REVIEW REPORT

VELSICOL CHEMICAL CORPORATION SITE
ST. LOUIS, MICHIGAN

Pursuant to CERCLA
42 U.S.C. Sect. 9621

Prepared by:
U.S. Environmental Protection Agency
Region 5
Chicago, Illinois



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8/27/87
Date

I. INTRODUCTION

A. Authority and Purpose

The U.S. Environmental Protection Agency (U.S. EPA), Region 5, conducted this policy five-year review under Section 121 of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). The purpose of a policy five-year review is to evaluate whether a completed remedial action remains protective of human health and the environment at sites where hazardous waste remains on-site at levels that do not allow for unlimited use and unrestricted exposure. The Type Ia review conducted for this site is applicable to a site at which response is ongoing. This review will be placed in the Site files and local repository for the Velsicol Chemical Site ("Site") in St. Louis, Michigan.

B. Site History

The Velsicol Chemical Corporation (VCC) Plant Site is a 56 acre site that was once occupied by a chemical processing plant. The VCC Plant (formerly the Michigan Chemical Corporation Plant) operated from 1936 through 1978 and manufactured a variety of organic and inorganic chemicals including polybrominated biphenyls (PBB), hexabromobenzene (HBB), DDT, and TRIS. The plant site represented a threat to public health, welfare, and the environment because of widespread contamination caused by poor waste management practices. These practices included process waste discharges to the adjoining Pine River Reservoir. The Site was proposed for inclusion on the National Priorities List (NPL) on December 30, 1982, and appeared on the final NPL on September 8, 1983.

The Site, and the Pine River, have been the subject of a number of investigations conducted by the Michigan Department of Natural Resources (MDNR), the U.S. EPA and Velsicol. The studies revealed Site soils contaminated with PBB, HBB, TRIS and other contaminants; ground water contaminated with vinyl chloride, toluene, chlorobenzene, DDT, and other contaminants; Pine River sediments contaminated with PBB, HBB, and DDT; and elevated levels of PBB, DDT, and other contaminants in fish from the Pine River. Pine River surface water did not contain measurable levels of contaminants associated with the Site. Also included in some of these studies were other site characterization data (hydrogeology, hazard assessment, etc.) upon which remedial action alternatives could be evaluated and chosen.

Initial remedial measures for the Site began in October, 1978, with closure of the Plant, cessation of discharges to the Pine River, and demolition of buildings and structures on the Site. Site characterization investigations began in 1978 and continued through 1980.

With the site characterization complete, the U.S. EPA, the State of Michigan, and Velsicol cooperated to select a remedy directed at stopping the migration of PBB, HBB, DDT and other contaminants found at the site into the environment. The remedy selected included excavation and disposal of contaminated soils in an on-site disposal area; isolation of the Site from

surrounding groundwater with a 2 foot thick, low-permeability slurry wall around the perimeter of the Site; covering the Site with a 3 foot thick, low-permeability, clay cap; implementation of other measures including dust control, construction equipment decontamination, air monitoring, monitor well installation, ground water elevation monitoring, control of ground water levels within the Site boundaries, and provisions for long-term operation and maintenance of the Site. This remedy was implemented by Velsicol as a requirement of a December 27, 1982, judicial Consent Judgment (CJ) between U.S. EPA, the State of Michigan, and Velsicol.

Implementation of the remedy required by the Consent Judgment began in January, 1983, and was completed, on schedule, in November, 1984. The Site is now covered with shallow-rooted grass, and, to restrict access, enclosed by a chain link fence. Velsicol is currently operating and maintaining the Site in accordance with an approved operation and maintenance plan requiring weekly inspections for signs of deterioration, quarterly monitoring of gas vents, measurement of groundwater levels within the contained site, and slurry wall permeability testing.

The Consent Judgment did not require Velsicol to remove the contaminated sediments from the Pine River Reservoir. Contamination of the fish in the river was addressed by health advisories issued by the State of Michigan. A no consumption advisory for all species of fish has been in effect since 1974.

Water levels inside the Containment System (slurry wall and cap) remained below the level set by the 1982 CJ until February 1992. The exceedence in February was temporary, water levels dropped below the CJ level in June 1992. The water levels again exceeded the CJ level in February 1993 and did not drop below the required level until Velsicol completed a ground water removal action, pumping 1.25 million gallons of water from the system with off-site disposal. In late 1994 Velsicol again had to pump 1.28 million gallons of ground water from the system to maintain the required level. Velsicol continued to have to pump water from the Containment System approximately every 6 months to maintain the required water level. U.S. EPA and the Michigan Department of Environmental Quality (MDEQ) asked Velsicol to complete a comprehensive assessment of the Containment System. Velsicol agreed and completed the assessment in 1996 with U.S. EPA and MDEQ (the Agencies) oversight. Assessment of the clay cap included collection of samples from the upper portion of the cap on a 250 foot grid and analyzed for permeability, grain size, and Atterberg limits. Assessment of the containment wall consisted of installation of inclinometers inside and outside the slurry wall at seven locations, installation of settlement plates at seven locations inside the slurry wall, collection of samples at nine locations for permeability analysis; installation of upper zone piezometers on the inside and outside of the wall at five locations; water level measurements and free product screening from all monitoring wells and piezometers; and dye tracer study at the five locations were the piezometers were installed.

The Agencies believe the results of the Containment System Assessment show that the clay cap

is leaking and the slurry wall is leaking in at least one location. Velsicol concluded in their report of the findings that the Containment System is working as designed. The Agencies provided written comments to Velsicol on the report findings and are discussing the potential need for repairs to the system with Velsicol.

Simultaneously with the Containment System Assessment, the Agencies began a reassessment of contamination in the Pine River/St. Louis Impoundment. Sediment cores were collected from 23 locations in the St. Louis Impoundment and analyzed for PBB, HBB and DDT. Surficial sediment samples were also collected from depositional areas in the lower Pine River. In 1997 the Agencies collected another round of sediment cores. The sediment data and fish tissue data are currently being reviewed by the Agencies.

II. DISCUSSION

A. Remedial Objectives

There is no Record of Decision for this site. The remedy was set forth in the 1982 CJ. The 1982 CJ states that the purpose of the CJ is to protect against alleged endangerment to the public health and the environment from chemical contamination resulting from operations at Velsicol's St. Louis facilities. The 1982 CJ also states that the most appropriate environmental alternative for the Pine River/St. Louis Reservoir sediments is to leave the existing contaminated sediments undisturbed.

B. Remedial Action

The remedy set forth in the 1982 CJ included excavation and disposal of contaminated soils in an on-site disposal area; isolation of the Site from surrounding groundwater with a 2 foot thick slurry wall around the perimeter of the Site; covering the Site with a 3 foot thick clay cap; monitor well installation; control of ground water levels within the slurry wall boundaries; and provisions for long-term operation and maintenance of the Site.

Implementation of the remedy began in January, 1983, and was completed, on schedule, in November, 1984. The Site is now covered with shallow-rooted grass and a chain link fence. Velsicol is currently maintaining the Site in accordance with an approved operation and maintenance plan requiring weekly inspections for signs of deterioration, quarterly monitoring of gas vents, measurement of groundwater levels within the contained site, and slurry wall permeability testing.

The Consent Judgment did not require Velsicol to remove the contaminated sediments from the Pine River Reservoir. Contamination of the fish in the river was addressed by health advisories issued by the State of Michigan. A no consumption advisory for all species of fish has been in effect since 1974.

III. RECOMMENDATIONS

The Containment System remedy is currently being evaluated by the Agencies to ensure it continues to be protective of human health and the environment. The Agencies will be meeting with Velsicol at the end of August, 1997 to discuss the results of the Containment System assessment and the need to make repairs to the system. In addition, the Agencies are reevaluating the 1982 decision to leave contaminated sediments from the St. Louis Reservoir in place.

IV. STATEMENT OF PROTECTIVENESS

The Agencies are currently evaluating the structural integrity of the Containment System to ensure that additional contaminants are not released to the environment. The Agencies are also re-evaluating the 1982 decision to leave contaminated sediments in the St. Louis Reservoir.

V. NEXT FIVE YEAR REVIEW

The next five year review will be conducted by September 1, 2002, which is five years from the date of this review.